

Abstract

Federal, state and local officials are planning for a (M) 7.8 San Andreas Earthquake Scenario in the Southern California Catastrophic Earthquake Response Plan that would require initial emergency food and water resources to support from 2.5 million to 3.5 million people over an eight-county region in Southern California. However, a model that identifies locations of affected populations—with consideration for social vulnerability, estimates of their emergency logistical resource requirements, and their resource requirements over time—has yet to be developed for the emergency response plan.

The aim of this study was to develop a modeling methodology for emergency logistical resource requirements of affected populations in the (M) 7.8 San Andreas Earthquake Scenario in Southern California. These initial resource requirements, defined at three-days post-event and predicted through a probabilistic risk model, were then used to develop a relative risk ratio and to estimate resources requirements over time. The model results predict an “at-risk” population of 3,352,995 in the eight-county study region. In Los Angeles County, the model predicts an “at-risk” population of 1,421,415 with initial requirements for 2,842,830 meals and 4,264,245 liters of water. The model also indicates that communities such as Baldwin Park, Lancaster-Palmdale and South Los Angeles will have long-term resource requirements.

Through the development of this modeling methodology and its applications, the planning capability of the Southern California Catastrophic Earthquake Response Plan is enhanced and provides a more effective baseline for emergency managers to target emergency logistical resources to communities with the greatest need. The model can be calibrated, validated, generalized, and applied in other earthquake or multi-hazard scenarios through subsequent research.